

REMARKS/ARGUMENTS

Claims 1-15 are pending in this application. Pursuant to a provisional election made during a telephone discussion on January 22, 2007 with applicant's representative, claims 1-11 have been examined while claims 12-15 are withdrawn from consideration by the Examiner. In this response, claims 1, 4, 5 and 7 have been amended to more clearly recite the invention. The amendments are all entirely supported by the application as filed and, therefore, they raise no issue of new matter. Upon entry of this Amendment into the file of the application, claims 1-15, as amended, will be pending.

Restriction Requirement

The Examiner has required an election between two groups of claims, namely:

Group I - claims 1-11; and

Group II - claims 12-15,

for continued prosecution in this application. During a telephone conversation with applicants' representative on January 22, 2007, a provisional election was made with traverse to prosecute the invention of Group I, i.e., claims 1-11. Applicants hereby affirm the provisional election made on the above date while reserving the right to pursue patent protection for the subject matter of the non-elected Group (claims 12-15) in a divisional patent application. As a result of the election, the Examiner has withdrawn claims 12-15 from consideration in the present case as being directed to a non-elected invention.

Claim Objections

Claims 4, 5, 7 and 13-15 are objected to for the reasons set forth in ¶3 on p. 3 of the Office Action. These objections are respectfully traversed.

In response to the objections, applicants have amended claims 4, 5 and 7 as recommended by the Examiner. These amendments are believed to overcome the Examiner's objections to the subject claims. No amendments were made, however to any of claims 13-15

since these claims have been withdrawn from consideration by the Examiner in the present case and, thus, no amendments of those claims was deemed necessary.

Claim Rejections Under 35 U.S.C. §103

Claims 1-3 and 6-11 are rejected under 35 U.S.C. §103 as being allegedly unpatentable over USP 6,136,062 to Loffelholz, et al. in view of USP 5,417,917 to Takahar, et al. for the reasons set forth on pps. 4-5 of the Office Action. Applicants' respectfully traverse the subject rejection for the reasons set forth below.

Of the rejected claims mentioned above, only claim 1 is written in independent form. As amended, the subject claim recites a metal powder production process using a metal compound as a raw material, wherein the metal compound is reduced. As set forth in claim 1, the method comprises a molding step in which the metal compound is mixed with a binder, is molded, and is sintered to produce a metal compound feed compact, and a reducing step in which a metal is formed by reducing the metal compound feed compact by contacting the metal compound feed compact with an active metal as a reducing agent, wherein, the active metal is vaporized by heating to contact the metal compound feed compact.

Loffelholz et al. (USP 6,136,062) disclose a metal for producing niobium and/or tantalum powders by reducing the metal compounds with an active metal as a reducing agent. The reducing reaction is conducted in a vessel by heating the active metal to be melted, adding the metal compound to the melted active metal, and mixing them using a stirrer. Thus, the raw material physically contacts both the vessel and the stirrer. As a consequence, the active metal could not be supplied homogeneously. The result of this is that the metal powder thus obtained is not uniform. In addition, contamination may occur in the vessel as a result of the process described in the reference.

In contrast, in the present invention as recited in claim 1 (as now amended) the active metal is vaporized by heating to contact the metal compound feed compact. Thus, the metal compound feed compact does not directly contact the reduction device. Contamination from the reduction device is thereby prevented, thus permitting an increase in the purity of the

resultant metal (e.g., niobium) powder in contrast to that obtained with the process as described in the cited reference.

Turning next to the Takahar et al. '917 reference combined by the Examiner with Loffelholz et al. to reject applicants' claims, it is noted that Takahar et al. disclose a method for producing an open cell porous metallic material. The method disclosed in the reference involves the steps of: mixing a powdery metal compound with a binder; molding the mixture to a desired shape; and sintering the compact to produce a sintered metal compound compact, followed by a reducing step. Takahar et al. '917 only discloses hydrogen as the reducing agent. In contrast, applicants' claim 1 recites a vaporized active metal as the reducing agent. In addition, since the open cell porous metallic material produced in Takahar is produced for the purpose of applying it to filters, electrodes for fuel cells and the like, it is not reasonable to assume, based on the disclosure of the reference, that the result of the method disclosed therein would be a uniform metal powder of high purity, e.g., Nb, Ta, etc. such as would result with the method according to the present invention.

As can readily be seen from the above discussion, therefore, the process recited in claim 1 is clearly not obvious over both Loffelholz et al. and Takahar et al., whether those references are taken alone or in combination. In addition, claims 2-3 and 6-11 each depend directly or indirectly from claim 1 and, as such, they contain all of the recitations set forth in the subject claim. Those claims are, therefore, believed to be distinguishable over the cited combination of references for the same reasons as claim 1. The Examiner is, therefore respectfully requested to reconsider and withdraw the rejection of claims 1-3 and 6-11.

Claim 4 is rejected over Loffelholz et al. in view of Takahar et al. as applied to claim 1, and further in view of USP 3,839,020 to Honma et al. for the reasons given in ¶5 on p. 5 of the Office Action. This rejection is also respectfully traversed.

Claim 4 is directed to a method of powder production according to claim 1 wherein a compound of a metal element selected from zirconium, titanium, hafnium, rare earth metal or actinide metal is used as the metal compound. Claim 4 depends from claim 1 and thus includes all of the recitations found in that claim. As such, the subject claim is thus distinguishable over both Loffelholz and Takahar. Honma et al., furthermore, does not suggest the elements of the

invention (as recited in claim 1) which are missing from Loffelholz et al. and Takahar et al. That is, Honma et al. disclose an alloy sponge of titanium or a zirconium base metal produced by admixing a halide of an additive alloy element with titanium tetrachloride or zirconium tetrachloride and, thereafter, reducing both simultaneously with a metallic alloy to produce the alkali or titanium or zirconium.

Applicants respectfully contend, in light of the comments set forth above, that it would not have been obvious to one having ordinary skill in this art at the time the invention was made, based upon the combined disclosure of the references cited to reject claim 4, to substitute niobium oxide with a zirconium compound to be reduced by contacting an active metal as disclosed by Honma et al. in the process according to Loffelholz et al. in view of Takahar et al. in order to produce highly uniform and pure zirconium alloy ingots efficiently and economically as disclosed by Honma et al. when it is desired to form a zirconium compact, as suggested in the Office Action. The Examiner is, therefore, respectfully requested to reconsider and withdraw the rejection of claim 4.

Further to the above, claim 5 is rejected under §103 as being allegedly unpatentable over Loffelholz et al. in view of Takahar et al. as applied to claim 1, and further in view of USP 6,015,527 to Kamei et al. The rejection is respectfully traversed as well.

As in the case of claim 4 discussed above, claim 5 also depends from claim 1 and thus includes all of the features recited in the subject claim. Claim 5 is, therefore, believed to be distinguishable over both Loffelholz et al. and Takahar et al. for the same reasons as claim 1.

The remaining reference, i.e., Kamei et al. discloses a method for producing a reduced iron comprising mixing a metal compound and powdery solid reductants, wherein some amount of water or binder or both may be added. The “powdery solid reductants” are described in the reference as, “powders of a solid material containing mainly carbon, such as coal, charcoal, petroleum cokes, cokes, and the like.

Based on the comments contained in the Office Action, the Examiner appears to believe that the powdery solid reductants disclosed by Kamei et al. correspond to the reaction agents recited in claim 5. Applicants respectfully disagree with this conclusion, however.

In applicants' specification, on page 6, the last paragraph states that, "in the aforementioned molding step for producing a niobium compound feed compact, the niobium compound feed compact can be produced by additionally mixing in a reaction agent an active metal compound as a reaction agent in addition to the niobium compound and binder. Although an active metal compound as the aforementioned reaction agent can also be used as a binder, it can also be used to control the morphology of deposit of the niobium powder as well as increase acid treatment efficiency. In this manner, by producing the niobium compound feed compact by mixing in an active metal compound as a reaction agent in addition to the niobium compound and binder, the reaction in the reducing step proceeds more uniformly and the production efficiency can be increased. Moreover, the particle size of the resulting niobium powder can also be controlled by regulating the type and mixing ratio of the aforementioned reaction agent. In addition, contamination from the reaction vessel can also be effectively prevented." It is readily apparent from the teaching quoted above, therefore, that the role of the "powdery solid reductants" disclosed by Kamei et al. ('527) is entirely different from that of the reaction agents recited in claim 5.

Applicants thus respectfully contend, in light of the comments set forth above, that it would not have been obvious to one having ordinary skill in this art at the time the invention was made, based upon the combined disclosure of the references cited to reject claim 5, to mix the metal compound, reductants and a binder together for molding as disclosed by Kamei et al. in the process according to Loffelholz et al. in view of Takahar et al. in order to produce highly uniform and pure titanium and zirconium alloy ingots efficiently and economically as disclosed by Kamei et al., as postulated in the Office Action. The Examiner is, therefore, respectfully requested to reconsider and withdraw the rejection of claim 5.

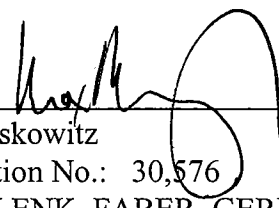
Summary

The claim amendments and arguments presented above are believed to overcome all of the Examiner's objections to and rejections of the claims. The Examiner is, therefore, respectfully requested to reconsider and withdraw each of those objections and rejections.

If the Examiner does not agree, however, and believes that an interview would advance the progress of this application, he is respectfully invited to telephone applicants' representative at the number below.

Respectfully submitted,

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